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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,677	11/19/2003	Sean P. Palecek	960296.00101	9323

26734 7590 05/18/2007

QUARLES & BRADY LLP
33 E. MAIN ST, SUITE 900
P.O. BOX 2113
MADISON, WI 53701-2113

EXAMINER	
KIM, TAEYOON	
ART UNIT	**PAPER NUMBER**
1651	

MAIL DATE	DELIVERY MODE
05/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/717,677	PALECEK ET AL.	
	Examiner	Art Unit	
	Taeyoon Kim	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-13 and 15-25* is/are pending in the application.

4a) Of the above claim(s) *1,3-12 and 25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13 and 15-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1, 3-13 and 15-25 are pending.

Response to Amendment

Applicant's amendment and response filed on Mar. 5, 2007 has been received and entered into the case.

Claims 2 and 14 are canceled, claims 1, 3-12 and 25 have been withdrawn from consideration as being drawn to non-elected subject matter. Claims 13 and 15-24 have been considered on the merits. All arguments have been fully considered.

Due to the amendment, claim rejections made in the previous office action have been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 13 and 15-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flexcell (http://web.archive.org/web/19970405162526/http://www.flexcellint.com/) and Banes (US 6,037,141) in view of Xu et al. (2001) and Thies (US 2003/0109038).

Claims 13 and 15-24 are drawn to a cell culture composition comprising mammalian embryonic stem cells in culture without conditioned media or fibroblast feeder cells, a flexible solid porous matrix where the cells are grown, and an apparatus for applying periodic strain on the flexible matrix to stretch the matrix and cells thereon (claims 13, 16); a limitation to the cells being human embryonic stem cells (claim 15); a limitation to the cell being grown on Matrigel using BioFlex untreated culture plates (claim 17); a limitation to the cells being grown without the presence of cross-species biological material (claim 18); a limitation to the flexible solid porous matrix being Matrigel (claim 19); a limitation to the strain being mechanically produced (claim 20); a limitation to the flexible matrix being stretched using vacuum pressure (claim 21); a limitation to the strain being from oscillatory stretching of the flexible matrix surface (claim 22); a limitation to the strain exerted on the flexible matrix being at least about 5% (claim 23); a limitation to the flexible matrix undergoing at least about 6 stetches per minute (claim 24).

The web page of Flexcell International Corporation (now on Flexcell; whole document) teaches a cell culture apparatus with BioFlex culture plates, which can provide periodic strain by applying vacuum pressure, and oscillatory strain.

Banes also teach a culture compression device made from a flexible membrane, wherein the cell culture can be compressed to introduce mechanical strain with cycles of pressure pulses (periodic strain). Banes teaches that force can be applied by Flexercell strain unit, which is identical as the Flexcell system taught by the web page (see Abstract and column 6, lines 54-67).

Flexcell or Banes does not teach a cell being human embryonic stem cell, and a flexible porous matrix.

Xu et al. teach a culture of human embryonic stem (hES) cells grown on Matrigel without conditioned media or feeder cells, which inhibits differentiation of hES cells (see whole document).

It would therefore have been obvious for the person of ordinary skill in the art at the time the invention was made to use the apparatus of Flexcell to grow hES cells grown on Matrigel taught by Xu et al. because the apparatus of Flexcell can be used for any type of cells and/or cell cultures including hES cells. A person of ordinary skill in the art at the time of the invention made would have recognized hES cells as another example of cells to be grown using the apparatus taught by Flexcell. The motivation of using the apparatus of Flexcell in hES cell culture is provided by Banes that chondrocytes, cells for cartilage transplantation, would be advantageous when they are grown under compression (mechanical pressure/strain), which allows the cells to acquire ability to withstand compressive loads. Since hES cells can be differentiated into chondrocytes which constitute cartilage as supported by Thies, a person of ordinary skill in the art would have envisaged growing hES cells using an apparatus of Flexcell

and/or Banes to obtain a plurality of cells, which would be differentiated into chondrocytes prior to transplantation.

Although the references above do not particularly teach the strain level (at least 5%) or frequency of stretches, it would have been obvious for a person of ordinary skill in the art because Banes clearly indicates that the various strain rate and levels of compressive loads used in the claimed invention are result effective variables. As such, the variables would be routinely optimized by one of ordinary skill in the art in practicing the invention disclosed by those references. Generally, differences in concentration will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 CCPA 1955) (Claimed process which was performed at a temperature between 40°C and 80°C and an acid concentration between 25% and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed atl a temperature of 100°C and an acid concentration of 10%.); >see also Peterson, 315 F.3d at 1330, 65 USPQ2d at 1382 ("The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."); ** In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (Claimed elastomeric polyurethanes which fell within the broad scope of the :references were held to be unpatentable thereover

because, among other reasons, there was no evidence of the criticality of the claimed ranges of molecular weight or molar proportions.). For more recent cases applying this principle, see Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). Accordingly, the claimed invention was prima facie obvious to one of ordinary skill in the art at the time the invention was made especially in the absence of evidence to the contrary.

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taeyoon Kim whose telephone number is 571-272-9041. The examiner can normally be reached on 8:00 am - 4:30 pm ET (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Taeyoon Kim
Patent Examiner
Art Unit 1651

Leon B Lankford, Jr
Primary Examiner
Art Unit 1651